CITY OF MILPITAS
Building & Safety Department
455 E. Calaveras Blvd.
Milpitas, CA 95035
408-586-3240
www.ci.milpitas.ca.gov

RESIDENTIAL WATER PIPING

1. PERMIT INFORMATION:

- ❑ This permit is for the replacement of existing water piping with new (for example, galvanized with copper). Plumbing faucets and valves may be replaced in the same location as part of the water piping replacement permit.
- ❑ This permit does not include replacing or repairing the tub or tub-shower enclosure, lavatories or sinks, adding new water piping as part of a larger remodeling project, or relocating plumbing fixtures, faucets, or valves.
- ❑ Extensive removal of the walls or ceiling structure requires a building permit.
- ❑ A Building Permit may be issued only to a State of California Licensed Contractor or the Homeowner.
- ❑ If the work is performed by the Homeowner personally or by his/her workers, and an inspection indicates the work cannot be completed satisfactorily, then a licensed contractor must perform the work.
- ❑ If the Homeowner hires workers, State Law requires the Homeowner to obtain Worker's Compensation Insurance. Proof of this insurance is required prior to inspection.

2. INSTALLATION REQUIREMENTS

- ❑ **Building Codes:** All work must comply with the 2010 California Building Code (CBC), 2010 California Residential Code (CRC), 2010 California Mechanical Code (CMC), 2010 California Electrical Code (CEC), 2010 California Plumbing Code (CPC), 2010 California Energy Code based upon 2008 Building Energy Efficiency Standards (CEnC) and 2011 Milpitas Municipal Code (MMC).
- ❑ The size of each water supply pipe from the meter to the fixture supply branches, risers, fixtures, connections, outlets, or other uses shall be based on the total demand and shall be determined according to the methods and procedures outlines in CPC Section 610.0.
- ❑ Materials:
  - Pipe may be brass, copper, CPVC, ductile-iron, galvanized steel, malleable iron, PE-AL-PE (polyethylene-aluminum-polyethylene), PEX (cross-linked polyethylene) or stainless steel (CPC Table 6-4).
  - All pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed or labeled (third-party certified) by an approved listing agency (CPC 301.1.1).
  - Each length of pipe and each pipe fitting, trap, fixture, material, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it the manufacturer's mark or name, which shall readily identify the manufacturer to the end user of the product. When required by the approved standard that applies, the product shall be marked with the weight and the quality of the product. Such marking shall be done by the manufacturer. Field markings shall not be acceptable. (CPC 301.1.2)
  - Pipe, tube, and fittings carrying water used in potable water systems intended to supply drinking water shall meet the requirements of NSF 61, Standard for Drinking Water System Components, as found in CPC Table 14-1. Materials used in the water supply system, except valves and similar devices, shall be of a like material. Materials shall be in accordance with the applicable standards referenced in Table 6-4. (CPC 604.1)

- Copper tube for water piping shall have a weight of not less than Type L, except Type M copper tubing shall be permitted to be used above ground in, or on, a building or underground outside of structures (CPC 604.2).

- Hard-drawn copper tubing for water supply and distribution in addition to the required incised marking, shall be marked in accordance with ASTM B 88 Seamless Copper Water Tube as referenced in Table 14-1. The colors shall be: Type K, green; Type L, blue; Type M, red. (CPC 604.3)

- Fittings used with PEX and PE-AL-PE tubing shall be manufactured to and marked in accordance with the standards for the fittings referenced in Table 14-1 (CPC 6-04.11.1 and 604.13.1).

- PEX tubing shall meet the requirements of NSF P171 CL-R, ASTM F 876-08 or an equivalent or more stringent standard when used in continuously recirculating hot water systems where chlorinated water is supplied to the system and the PEX tubing is exposed to the hot water 100% of the time (CPC Table 6-4, FN4)

- Flexible corrugated connectors of copper or stainless steel shall be limited to the following lengths: water heaters, 24 inches; fixture connectors, 30 inches; washing machine connectors, 72 inches; dishwasher and icemaker connectors, 120 inches (CPC 604.12).

- Flexible metallic water heater connectors or reinforced flexible water heater connectors connecting water heating to the piping system shall be in compliance with the applicable standards referenced in Table 14-1 (CPC 604.14).

- No person shall use any pipe, pipe or plumbing fitting or fixture, solder, or flux that is not lead free. Lead free means not more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent when used with respect to the wetted surfaces of pipes and pipe fittings, plumbing fittings, and fixtures. All pipe, pipe or plumbing fittings or fixtures, solder, or flux shall be certified by an independent ANSI accredited third party. (CPC 316.1.3 and Health & Safety Code 116875)

❑ Joints and connections:

- Joints and connections shall be in accordance with CPC Sections 316.0 and 606.0.

- Burred ends of all pipe and tubing shall be reamed to the full bore of the pipe or tube, and all chips shall be removed (CPC 313.0).

❑ Fixtures:

- Shower heads shall be designed and installed so that they will not exceed a water supply flow rate of 2.5 gallons per minute measured at 80 psi (CPC 402.1.1).

- Faucets at kitchens, lavatories, wetbars, laundry sinks, or other similar use fixtures shall be designed and manufactured so that they will not exceed a water supply flow rate of 2.2 gallons per minute measured at 60 psi (CPC 402.1.2).

- Water closets shall use no more than an average of 1.6 gallons of water per flush. After July 1, 2011, they shall have an effective flush volume not exceeding 1.28 gallons for single flush and dual flush toilets (CPC 402.2).

- Where two separate handles control the hot and cold water, the left-hand control of the faucet when facing the fixture shall provide the means to alter the hot water temperature. Single-handle mixing valves shall have the flow of hot water correspond to the markings on the fitting. (CPC 415.0)

- The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 120°F by a device that conforms to ASSE 1070 or CSA B125.3. The water heater thermostat shall not be considered a control for meeting this provision. (CPC 414.5)

- Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection. These valves shall conform to ASSE 1016 or ASME A112.18.1/CSA B125.1. Handle position stops shall be provided on such valves and shall be adjusted per the manufacturer's instructions to deliver a maximum mixed water setting of 120°F. The water heater thermostat shall not be considered a suitable control for meeting this provision. (CPC 418.0)

- Drinking water treatment units shall be installed in accordance with CPC 611.0.

❑ Valves:

- Valves shall be brass or other approved material. Each gate or ball valve shall be a fullway type with working parts of non-corrosive material. Valves shall meet the requirements of NSF 61, Standard for Drinking Water System Components, as referenced in Table 14-1. (CPC 605.1)

- A fullway valve shall be installed on the discharge side of each water meter to shut-off each building. The valve shall be accessible at all times. (CPC 605.2)

- A fullway valve shall be installed on the cold water supply pipe to each water heater at or near the water heater (CPC 605.2).

- In multidwelling units, one or more shutoff valves shall be provided in each dwelling unit so that the water supply to any plumbing fixtures in that dwelling unit can be shut off without stopping water supply to fixtures in other units. These valves shall be accessible in the dwelling unit that they control. (CPC 605.3)

- A control valve shall be installed immediately ahead of each water-supplied appliance and immediately ahead of each slip joint or appliance supply (CPC 605.5). Valves shall be accessible (CPC 605.6).

- A union shall be installed in the water supply piping not more than 12 inches of regulating equipment, water heating, conditioning tanks, and similar equipment that requires service by removal or replacement (CPC 609.5).

❑ General requirements:

- CPVC piping must be installed in accordance with CPC Section 604.1.1. Prior to issuance of any plumbing permit to install CPVC a Certificate of Compliance for Installation of CPVC Materials must be filled out and signed as required. This certificate acknowledges the health & safety hazards associated with CPVC installations and the requirements for an injury prevention plan and worker safety training. The certificate also indicates the person signing will comply with the flushing requirements and worker safety measures as set forth in Section 1.2 of Appendix I of the California Plumbing Code, Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-2006.

- PEX and PE-AL-PE piping shall be installed in accordance with manufacturer's installation standards. A copy of the standards shall be onsite for review by the Building Inspector.

- PEX and PE-AL-PE tubing shall not be installed within the first 18 inches of piping connected to a water heater (CPC 604.11.2 and 604.13.2).

- Listed flexible copper water connectors shall be installed in readily accessible locations, unless otherwise listed (CPC 604.4).

- Dielectric unions shall be used at all points of connection where there is a dissimilarity of materials (CPC 316.2.4).

- Piping in connection with a plumbing system shall be so installed that piping or connections will not be subject to undue strains or stresses, and provisions shall be made for expansion, contraction, and structural settlement. No plumbing piping shall be directly embedded in concrete or masonry. No structural member shall be seriously weakened or impaired by cutting, notching, or otherwise, as defined in the California Building Code. (CPC 313.2)

- Suspended piping shall be supported at intervals not to exceed those shown in CPC Table 3-2 or as required by the manufacturer, whichever is more restrictive. Piping shall be supported in such a manner as to maintain its alignment and prevent sagging. Hangers and anchors shall be of sufficient strength to support the weight of the pipe and its contents. Piping shall be isolated from incompatible materials. Hanger rod sizes shall be no smaller than 3/8 inch for pipe up to 4 inches. (CPC 314.0).

- Any structural member weakened or impaired by cutting, notching, or otherwise shall be reinforced, repaired, or replaced so as to be left in a safe structural condition in accordance with the requirements of the Building Code (CPC 313.11).

- Plastic and copper piping penetrating a framing member to within 1 inch of the exposed framing shall be protected by steel nail plates not less than No. 18 gauge in thickness. The steel nail plate shall extend along the framing member not less than 1 ½ inches beyond the outside diameter of the pipe or tubing. (CPC 313.9)

- Exterior wall openings shall be made water-tight (CPC 313.8).

- Ratproofing: Where openings have been made in walls, floors, or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved metal collars securely fastened to the adjoining structure. Tub waste openings in framed construction to crawl spaces at or below the first floor shall be protected by the installation of approved metal collars or metal screen securely fastened to the adjoining structure with no opening exceeding ½ inch in the least dimension. (CPC 313.12)

- Upon completion of a section or of the entire hot and cold water supply system, it shall be tested and proved tight by connecting to the water supply or, except for plastic piping, using a 50 psi air pressure test. In either method, the piping shall withstand the test without leaking for a period of not less than 15 minutes. (CPC 609.4) Test gauge shall have incrementation of 1 psi or less and shall not exceed 100 psi (CPC 319.0).

❑ Pressure regulator:

- Where the water pressure is in excess of 80 psi, an approved type pressure regulator preceded by an adequate strainer. The regulator and strainer shall be accessible, protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator. (CPC 608.2)

- ❑ Expansion Tank:

  - Any water system provided with a check valve, backflow preventer, pressure regulator or any other normally closed device that prevents dissipation of building pressure back into the water main shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized and installed in accordance with the manufacturer's recommendation. (CPC 608.3)

- ❑ Prevention of water contamination:

  - All hose-bibbs shall be protected by a non-removable hose-bibb type backflow preventer, a non-removable hose bibb-type vacuum breaker, or by an atmospheric vacuum breaker installed not less than six (6) inches above the highest point of usage located on the discharge side of the last valve (CPC 603.4.7).

  - Potable water supply to swimming pools, spas, and hot tubs shall be protected by an airgap or a reduced pressure principle backflow preventer when: 1) the unit is equipped with a submerged fill line; or 2) the potable water supply is directly connected to the unit circulation system (CPC 603.4.22).

  - If it would be possible for any used, unclean, polluted, or contaminated water, mixtures, or substances to enter any portion of the water piping system, such as through landscape irrigation piping, an approved back-flow prevention device must be installed. The device must be installed between the potable water supply and the irrigation system (CPC 603.4.6). If an atmospheric vacuum breaker device is installed, it must be installed a minimum of 6" above the highest sprinkler head or in accordance with it's listing (CPC Table 6-2).

- ❑ Grounding and bonding:

  - Grounding and bonding of the electrical service is required to be in accordance with the 2010 California Electrical Code when the water piping is replaced. If the existing metal underground water pipe is the only grounding electrode or if the metal underground water pipe is being replaced with plastic, an additional grounding electrode must be installed as permitted in CEC 250.52. **The metal underground water service pipe shall not be used as the sole grounding system; it must be supplemented with an additional electrode (CEC 250.53(D)(2).** Grounding of the metal underground water pipe must occur within the first 5 feet of the piping entering the building.

  - All grounding electrodes that are present at each building served shall be bonded together (CEC 250.50).

  - Metal water (hot and cold) and gas piping systems installed in or attached to a building or structure shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used in accordance with CEC Section 250.104.

3. INSPECTION PROCEDURES

- ❑ Two inspections are required, a rough and a final. The rough inspection should be scheduled when the new water line is installed and before it is covered up. A final inspection should be scheduled after all work is complete. For each inspection, the Permit Card and the Approved Job Copy of the Drawings (if any) must be presented to the inspector. Permits expire 180 days after issuance or last inspection passed, whichever is the latest.

4. QUESTIONS:

- ❑ If you have any questions regarding your project contact the Building & Safety Department at (408) 586-3240.

CITY OF MILPITAS

455 East Calaveras Boulevard, Milpitas, California 95035-5479 – www.ci.milpitas.ca.gov

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(408) 586-3240

Certificate of Compliance
For Installation of CPVC Plumbing Materials

(Pursuant to California Plumbing Code Section 604.1.1)

To: Chief Building Official:

I am the Owner-Builder or a Plumbing Contractor licensed by the State of California and seek a permit for residential construction that involves the installation of CPVC plumbing materials as provided for under California Plumbing Code (CPC) Section 604.1.1. In accordance with CPC Sections 604.1.1 (d), I hereby Certify that:

- ❑ **I, as an Owner-Builder, my employees and any workers, or**
- ❑ **As a Licensed Contractor, my employees, and any subcontractors, that:**
  - I/We are aware of the health and safety hazards associated with CPVC plumbing installations, and the solvents used for such installations. Our Illness and Injury Prevention Plan and its worker safety training elements include the hazards associated with CPVC plumbing pipe installations, and it meets the Department of Industrial Relation's guidelines; and
  - We will comply with the flushing requirements and worker safety measures (for gloving and ventilation) set forth in Section 1.2 of Appendix I of the California Plumbing Code: Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-2006.

I also certify that:

- The UPC/IAPMO approved CPVC piping material and solvent manufacturer's Installation Instructions will be posted at the jobsite during installation and will be available for inspection.
- We will maintain the required grounding and bonding required by the 2010 California Electrical Code Sections 250.52, 250.104 (A) and (B) and the receptacle, equipment, and circuit grounding required by 250.130 and 250.52(A)(1) if we replace a metallic system.

Job Name: _____ Permit #: _____

Job Street Address: _____ Suite/Unit# _____

Printed Name: _____ Title: _____

Company: _____ License #: _____

Address: _____

Signature: _____ Date: _____